

CLAIMS:

1. A method for isolating and culturing a previously unculturable microorganism, which comprises:

- 5 (i) collecting a sample from an environmental source;
- (ii) counting/estimating the number of microorganisms in the sample;
- (iii) diluting the sample in an appropriate medium;
- 10 (iv) adding a gelating agent such as to entrap one or more microorganisms within a sphere of the gelating agent;
- (v) coating the spheres containing the entrapped microorganism(s) with a natural or synthetic polymer to form a polymeric membrane;
- 15 (vi) incubating the coated spheres in the original environment for an appropriate time;
- (vii) cutting the spheres and scanning for microorganisms colonies; and
- 20 (viii) isolating the microorganisms, and repeating steps (iii) to (vii) until a pure clone of said previously unculturable microorganism is obtained.

2. A method according to claim 1 wherein said environmental source is a terrestrial, aquatic or marine source.

25 3. A method according to claim 1 or 2 wherein said appropriate medium of (iii) is a medium compatible with the environment from which the sample has been collected.

4. A method according to claim 1 wherein said gelating agent is a natural, semi-synthetic or synthetic gelating agent selected from agar, alginate, carrageenans, gum Arabic, guar gum, traganth gum, xanthan gum, propyleneglycolalginate, and mycrocrystalline cellulose, and is preferably agar.

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5. A method according to claim 1 wherein said gelating agent sphere of (iv) has a size from 0.1 mm or less to about 5 mm, preferably 1-2 mm in diameter.

10 6. A method according to claim 1 wherein said natural or synthetic polymer for coating the spheres containing the microorganism(s) is a natural or synthetic transparent or opaque polymer selected from a polysulfone, an alginate, an epoxy resin, a polyacrylamide, silica gel polysulfone, alginate and epoxy resin.

15 7. A microorganism isolated by the method according to claim 1.

8. A microorganism according to claim 7 consisting of a bacterium.

9. A library of microorganisms according to claim 7 or 8.

20 10. A method for genomic characterization of previously unculturable microorganisms, which comprises: (i) collecting a sample from an environmental source; (ii) counting/estimating the number of microorganisms in the sample; (iii) diluting the sample in an appropriate medium; (iv) adding a gelating agent such as to entrap one or more microorganisms within a sphere of the gelating agent; (v) coating the spheres containing the entrapped microorganism(s) with a natural or
25 synthetic polymer to form a polymeric membrane; (vi) incubating the coated spheres in the original environment for an appropriate time; (vii) cutting the spheres and extracting the microorganisms by chemical lysis using an agent for extraction of genomic DNA; (viii) processing the total genomic DNA to establish the restriction fragment length polymorphism (RFLP) pattern of the microorganisms;
30 (ix) analyzing the RFLP patterns to identify unique clones that are submitted to

sequence analysis; and (x) identifying the microorganisms by comparison of these sequences with sequences available at the GenBank database.

11. A method according to claim 10 wherein the microorganisms are isolated from a marine source, which comprises: (i) collecting a sample from a marine source; (ii) counting/estimating the number of microorganisms in the sample; (iii) diluting the sample in sterile seawater; (iv) adding a gelating agent such as to entrap one or more microorganisms within a sphere of the gelating agent; (v) coating the spheres containing the entrapped microorganism(s) with a natural or synthetic polymer to form a polymeric membrane; (vi) incubating the coated spheres in an aquarium containing seawater for an appropriate time; (vii) cutting the spheres and extracting the microorganisms by chemical lysis using an agent for extraction of genomic DNA; (viii) processing the total genomic DNA to establish the restriction fragment length polymorphism (RFLP) pattern of the microorganisms; (ix) analyzing the RFLP patterns to identify unique clones that are submitted to sequence analysis; and (x) identifying the microorganisms by comparison of these sequences with sequences available at the GenBank database.

12. A bacterium isolated by the method according to claim 11.

13. A method according to claim 11 wherein the marine source is coral mucus.

14. A bacterium isolated from coral mucus by the method of claim 13 and characterized by partial 16S rDNA sequence selected from the group consisting of SEQ ID NO:3, SEQ ID NO:4, and SEQ ID NO:5.

15. A method according to claim 10 wherein the microorganisms are isolated from a soil source.

16. A bacterium isolated from soil by the method according to claim 15 and characterized by partial 16S rDNA sequences selected from the group consisting of

the pair of sequences of SEQ ID NO:6 and SEQ ID NO:7, and SEQ ID NO:8 and SEQ ID NO:9.

17. Use of a library of microorganisms obtained by the method according to claim 1 for identification of new drugs.